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Cooper pairs on a spherical surface[1] JACQUES TEMPERE, VLADIMIR GLADILIN, Universiteit Antwerpen, ISAAC SILVERA, Harvard University, JOZEF DEVREESE, Universiteit Antwerpen — Superconductivity has been widely studied for flat, two-dimensional electron systems, such as electrons in copper-oxide planes or electron films on helium. In this contribution, we investigate how Cooper pairing is affected by curvature. In particular we investigate the pairing correlations of a spherical, two-dimensional electron gas. This system is realized in for example multielectron bubbles, and in metallic nanoshells. For the case of multi-electron bubbles, the pairing Hamiltonian can be solved exactly using Richardson's method. This reveals not only the structure of the ground state, but also the density of states of the excited states. We find that in the ground state, a redistribution of the electrons over the angular momentum levels occur, and that in the density of states a pseudogap appears. These results are put in the context of multielectron bubbles in helium, and compared to those for a flat 2D electron system.

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Jacques Tempere
Universiteit Antwerpen

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